Kramer Electronics, Ltd.

USER MANUAL

Model:

TP-575

HDMI Line Receiver / DA

Contents

1	**Introduction**	**1**
2	**Getting Started**	**1**
2.1	Quick Start	2
3	**Overview**	**3**
3.1	About HDMI	4
3.2	Defining EDID	5
3.3	Using Twisted Pair Cable	5
3.4	About the Power Connect™ Feature	5
3.5	Recommendations for Best Performance	5
4	**Your TP-575 HDMI Line Receiver / DA**	**6**
5	**Using the TP-575 HDMI Line Receiver / DA**	**7**
5.1	Connecting the TP-575 HDMI Line Receiver / DA	7
5.2	Wiring the Twisted Pair LINE IN / LINE OUT RJ-45 Connectors	9
5.3	Acquiring the EDID	10
6	**Technical Specifications**	**11**

Figures

Figure 1: TP-575 HDMI Line Receiver / DA 6
Figure 2: Connecting a TP-575 HDMI Line Receiver / DA 8
Figure 3: CAT 5 PINOUT 9

Tables

Table 1: TP-575 HDMI Line Receiver / DA Features 6
Table 2: CAT 5 PINOUT 9
Table 3: Technical Specifications of the TP-575 11

1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups[1] that are clearly defined by function.

Congratulations on purchasing your Kramer MegaTOOLS® **TP-575** *HDMI Line Receiver / DA* which is ideal for:

- Home theater, presentation and multimedia applications
- Rental and staging

The package includes the following:

- **TP-575** *HDMI Line Receiver / DA*
- Power supply (12V DC)
- This user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high-performance high-resolution cables[3]

You must use shielded Twisted Pair (STP) cabling with the **TP-575**, (refer to section 3.3 for further details).

1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download up-to-date Kramer user manuals from the Internet at this URL: http://www.kramerelectronics.com

3 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.

Step 1: Connect the machine - see section 5

PT-571

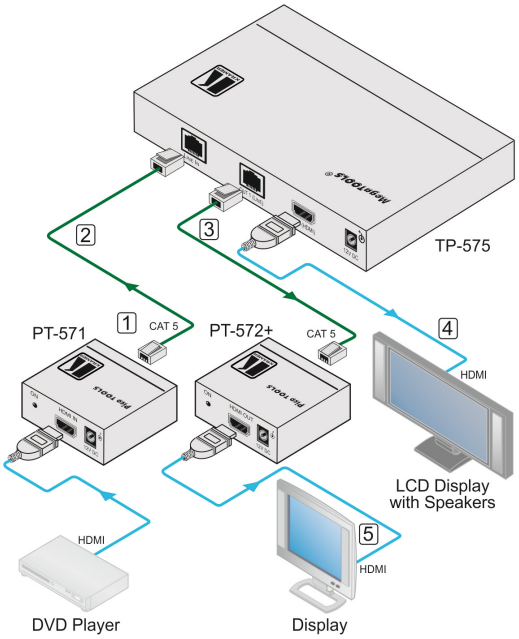
1. Connect the HDMI input (a DVD player)
2. Connect the twisted pair cable between the PT-571 OUT connector and the TP-575 LINE IN connector

TP-575

3. Connect the twisted pair cable between the OUT 1 (LINE) and the PT-572+
4. Connect the OUT 2 (HDMI) connector to an LCD display

PT-572+

5. Connect the HDMI OUT to a display



Connect the power to the TP-575

Step 2: Acquire the EDID - see section 5

You can acquire the EDID from:

- One Output (the relevant output illuminates)
- The Default EDID (both output LEDs blink)
- Two Connected Outputs, the Auto-mix Mode (both output LEDs illuminate)

Acquire the EDID via the front-panel button

3 Overview

The **TP-575** is a twisted pair line driver and DA for HDMI. The **TP-575** receives an HDMI signal from a transmitter (for example, the Kramer **PT-571**) via the LINE IN RJ-45 connector. It decodes this input signal to the local output and simultaneously transmits it to a TP receiver (for example, the **PT-572+**) which converts it back to an HDMI signal[1].

Using the **TP-575**, you can pass via the twisted pair cable:

- EDID (Extended Display Information Data) and HDCP signals
- HPD (Hot Plug Detect) signals from the display device to the source

The **TP-575** features:

- Up to 1.65Gbps bandwidth per graphic channel[2]
- HDTV compatibility
- A system range[3] of up to 90m (295ft) at 1080i, or up to 30m (98ft) at 1080p on shielded **BC-DGKat524** cable; 90m (295ft) at 1080i, or up to 70m (230ft) at 1080p on shielded **BC-DGKat623** cable; 100m (330ft) at 1080i or up to 90m (295ft) at 1080p on shielded **BC-DGKat7a23** cable.

  Use only shielded cables with the **TP-575** in which the cable Ground shielding must be connected / soldered to the shield of both RJ-45 connectors

- HDMI Support – HDMI (V.1.4 with Deep Color, x.v.Color™, HDMI Uncompressed Audio Channels, Dolby TrueHD, DTS-HD)
- Output signal reclocking, letting you daisy chain up to six receivers
- 3D Pass-Through
- The Power Connect System™ – A single connection to the **TP-575** powers the transmitter, receiver and line driver units
- The ability to read and store, in non-volatile memory, the default EDID, or the EDID[4] block from either or both of the output display devices, so it can then provide the EDID information to the HDMI sources even if the display device is not connected
- LEDs that indicate the selected input as well as the active output LED indication

1 The Kramer PT-571 and PT-572+ user manual is available on our Web site at http://www.kramerelectronics.com

2 Suitable for resolutions up to UXGA at 60Hz, and for all HD resolutions

3 Note that the transmission range depends on the signal resolution, graphics card and display used. The distance using non-Kramer CAT 5, CAT 6 and CAT 7a cables may not reach these ranges

4 EDID is Extended Display Identification Data (see section 3.2 for a more detailed definition)

The **TP-575** is 12V DC fed and is housed in a MegaTOOLS® enclosure where two units can be rack mounted side-by-side in a 1U rack space with the optional **RK-T2B** rack adapter.

3.1 About HDMI

High-Definition Multimedia Interface (HDMI) is an uncompressed all-digital[1] audio/video interface, widely supported in the entertainment and home cinema industry. It delivers the highest high-definition image and sound quality.

In particular, HDMI[2]:

- Provides a simple[3] interface between any audio/video source, such as a set-top box, DVD player, or A/V receiver and video monitor, such as a digital flat LCD / plasma television (DTV), over a single lengthy[4] cable
- Supports standard, enhanced, high-definition video, and multi-channel digital audio[5] on a single cable
- Transmits all ATSC HDTV standards and supports 8-channel digital audio, with bandwidth to spare to accommodate future enhancements and requirements
- Benefits consumers by providing superior, uncompressed digital video quality via a single cable[6], and user-friendly connector
- Is backward-compatible with DVI (Digital Visual Interface)
- Supports two-way communication between the video source (such as a DVD player) and the digital television, enabling new functionality such as automatic configuration and one-button play

HDMI has the capacity to support:

- Existing high-definition video formats (720p, 1080i, and 1080p/60), as well as standard definition formats such as NTSC or PAL

1 Ensuring an all-digital rendering of video without the losses associated with analog interfaces and their unnecessary digital-to-analog conversions

2 HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI licensing LLC

3 With video and multi-channel audio combined into a single cable, the cost, complexity, and confusion of multiple cables currently used in A/V systems is reduced

4 HDMI technology has been designed to use standard copper cable construction at up to 15m

5 HDMI supports multiple audio formats, from standard stereo to multi-channel surround-sound. HDMI has the capacity to support Dolby 5.1 audio and high-resolution audio formats

6 HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner

3.2 Defining EDID

The Extended Display Identification Data (EDID[1]) is a data-structure provided by a display to describe its capabilities to a graphics card (that is connected to the display's source). The EDID enables the **TP-575** to "know" what kind of monitor is connected to the output. The EDID includes the manufacturer's name, product type, timing data supported by the display, display size, luminance data and (for digital displays only) the pixel mapping data.

3.3 Using Twisted Pair Cable

Kramer engineers have developed special twisted pair cables to best match our digital twisted pair products; the Kramer: **BC-DGKat524** (CAT 5 24 AWG), the Kramer: **BC-DGKat623** (CAT 6 23 AWG cable), and the Kramer: **BC-DGKat7a23** (CAT 7a 23 AWG cable). These specially built cables significantly outperform regular CAT 5 / CAT 6 / CAT 7a cables.

Note: the **TP-575** cannot work with unshielded cables.

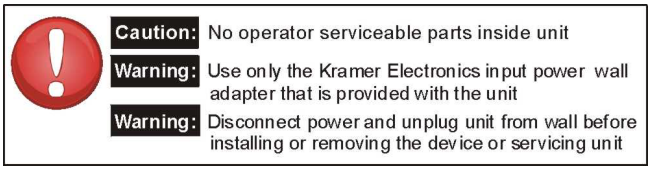
3.4 About the Power Connect™ Feature

The Power Connect™ feature here means that the **TP-575** unit can power both the transmitter and receiver when they are within 270 feet (90 meters) of the **TP-575**. The Power Connect™ feature applies as long as the cable can carry power. The distance does not exceed 90 meters on standard twisted pair cable, for longer distances, heavy gauge cable should be used[2].

3.5 Recommendations for Best Performance

To achieve the best performance:

- Connect only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoid interference from neighboring electrical appliances and position your **TP-575** away from moisture, excessive sunlight and dust


Caution: No operator serviceable parts inside unit
Warning: Use only the Kramer Electronics input power wall adapter that is provided with the unit
Warning: Disconnect power and unplug unit from wall before installing or removing the device or servicing unit

1 Defined by a standard published by the Video Electronics Standards Association (VESA)

2 CAT 5 cable is still suitable for the video/audio transmission, but not for feeding the power at these distances

4 Your TP-575 HDMI Line Receiver / DA

Figure 1 and Table 1 define the **TP-575** *HDMI Line Receiver / DA*:

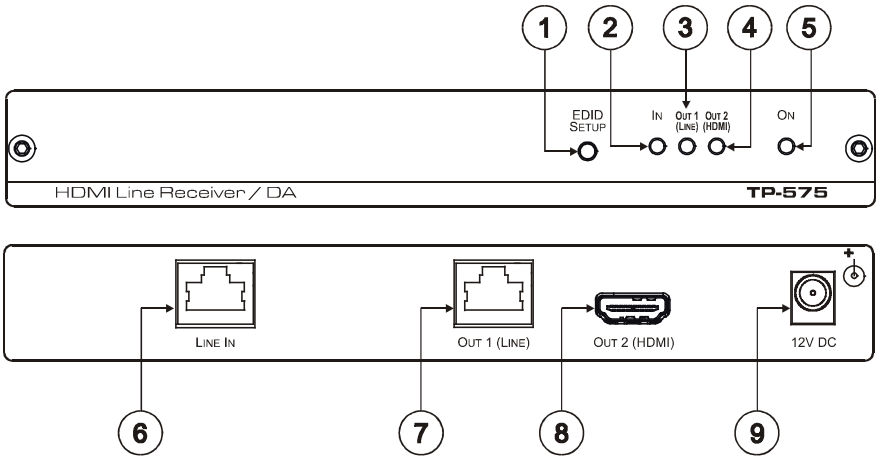


Figure 1: TP-575 HDMI Line Receiver / DA

Table 1: TP-575 HDMI Line Receiver / DA Features

#	Feature	Function
1	*EDID SETUP* Button	Press briefly to determine the type of EDID stored in the non-volatile memory Press and hold to select the desired EDID setup and then release to acquire EDID (see section 5.3)
2	*IN* LED	Illuminates when an input is connected
3	*OUT 1 (LINE)* LED	Illuminates when OUT 1 is connected and active Blinks when the monitor does not support HDCP[1]
4	*OUT 2 (HDMI)* LED	Illuminates when OUT 2 is connected and active Blinks when the monitor does not support HDCP[1]
5	*ON* LED	Illuminates when receiving power
6	*LINE IN* RJ-45 Connector	Connects to the CAT 5 OUT RJ-45 connector on the **PT-571**
7	*OUT 1 (LINE)* RJ-45 Connector	Connects to the CAT 5 IN RJ-45 connector on the **PT-572+**
8	*OUT 2 (HDMI)* Connector	Connects to the HDMI acceptor
9	*12V DC*	+12V DC connector for powering the unit

5 Using the TP-575 HDMI Line Receiver / DA

This section describes how to:

- Connect the **TP-575** (see section 5.1)
- Wire the twisted pair RJ-45 connectors (see section 5.2)
- Use the EDID SETUP button (see section 5.3).

1 This LED also illuminates or blinks during EDID setup (see section 5.3)

5.1 Connecting the TP-575 HDMI Line Receiver / DA

To connect the **TP-575** together with the **PT-571** *HDMI Line Transmitter* and the **PT-572+** *HDMI Line Receiver*, as illustrated in the example in Figure 2, do the following:

1. On the **PT-571**, connect an HDMI source (for example, a DVD player) to the HDMI IN connector.
2. Connect the CAT 5 OUT RJ-45 connector on the **PT-571** to the CAT 5 LINE IN RJ-45 connector on the **TP-575** via a twisted pair cable[1] (see section 5.2).
3. On the **TP-575**, connect the OUT 2 (HDMI) connector to an HDMI acceptor (for example, a plasma display).
4. Connect the OUT 1 (LINE) CAT 5 RJ-45 connector on the **TP-575** to the CAT 5 IN RJ-45 connector on the **PT-572+** via a twisted pair cable[1] (see section 5.2).
5. On the **PT-572+**, connect the HDMI OUT connector to an HDMI acceptor (for example, a plasma display).
6. Connect the 12V DC power adapter to the power socket[2] on the **TP-575** and connect the adapter to the mains electricity (not shown in Figure 2).
7. Press the EDID SETUP button to acquire or change the EDID information (see section 5.3).

1 Using the Kramer CAT 5 BC-DGKat524, CAT 6 BC-DGKat623 cable or BC-DGKat7a23

2 To power the TP-575 as well as the PT-571 and PT-572+

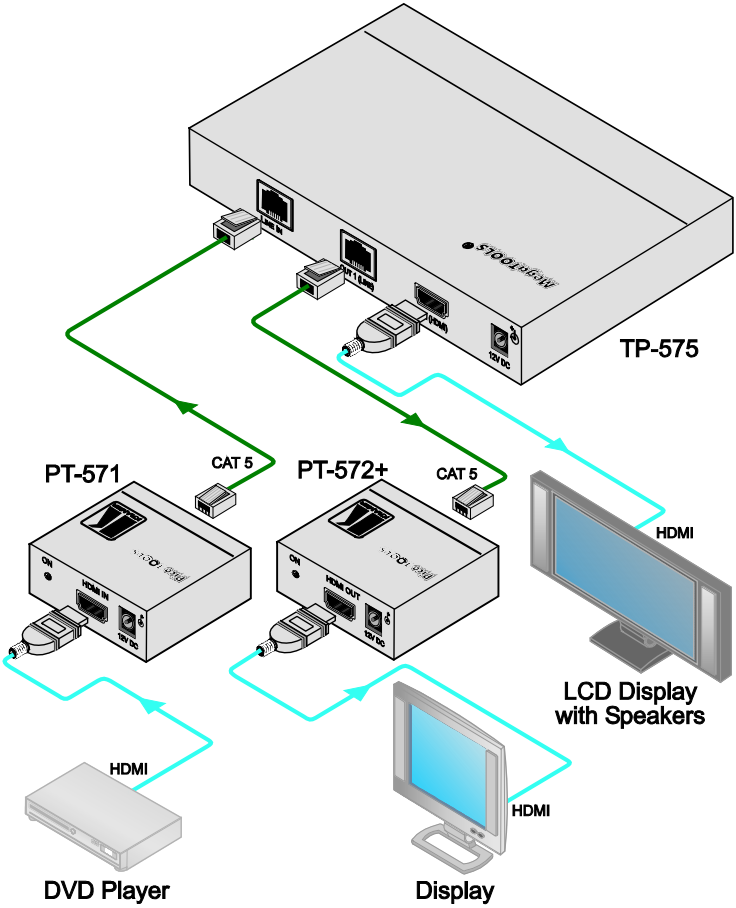


Figure 2: Connecting a TP-575 HDMI Line Receiver / DA

5.2 Wiring the Twisted Pair LINE IN / LINE OUT RJ-45 Connectors

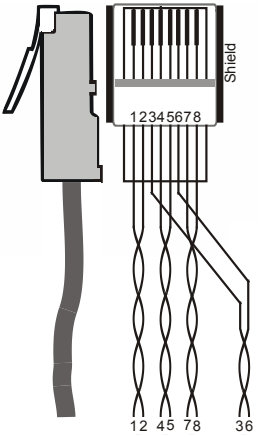
Table 2 and Figure 3 define the STP CAT 5 PINOUT[1], using a straight pin-to-pin cable with RJ-45 connectors (**note, that the cable Ground shielding must be connected / soldered to the connector shield**):

Table 2: CAT 5 PINOUT

EIA /TIA 568A	
PIN	**Wire Color**
1	Green / White
2	Green
3	Orange / White
4	Blue
5	Blue / White
6	Orange
7	Brown / White
8	Brown
Pair 1	4 and 5
Pair 2	3 and 6
Pair 3	1 and 2
Pair 4	7 and 8

EIA /TIA 568B	
PIN	**Wire Color**
1	Orange / White
2	Orange
3	Green / White
4	Blue
5	Blue / White
6	Green
7	Brown / White
8	Brown
Pair 1	4 and 5
Pair 2	1 and 2
Pair 3	3 and 6
Pair 4	7 and 8

Figure 3: CAT 5 PINOUT



1 CAT 6 or similar (heavier gauge) cabling can also be used

5.3 Acquiring the EDID

Initially, the **TP-575** operates with the factory default EDID[1]. This lets you connect the power before connecting one of the acceptors or sources[2].

You can acquire the EDID from:

- One output[3] (the relevant output illuminates)
- Two connected outputs, the Auto-mix Mode[4] (both output LEDs illuminate)
- The Default EDID (both output LEDs blink)

To acquire the EDID, do the following:

1. Connect the power.
2. Connect the output or outputs from which you want to acquire the EDID.
3. Press and hold the EDID SETUP button to select the desired EDID. The OUT LEDs illuminate in the following cycle: OUT 1 (LINE), OUT 2 (HDMI), both illuminate (Auto-mix[4]) and both blink (Default).
4. Release the button when reaching the desired set up[5]. The EDID is now acquired.

1 The TP-575 reads the EDID, which is stored in the non-volatile memory

2 This is usually done only once, when the machine is being set up in an installation. Once acquired, the EDID is saved in non-volatile memory and further acquisition is not necessary

3 The local output and the output on the receiver

4 The EDID acquired is a weighted average of all the connected outputs. For example, if several displays with different resolutions are connected to the outputs, the acquired EDID supports all the resolutions, as well as other parameters included in the EDID

5 If you set the machine to acquire the EDID from an output that is not connected, the Default EDID will be acquired

6 Technical Specifications

Table 3 includes the technical specifications[1] of the **TP-575**:

Table 3: Technical Specifications of the TP-575

INPUT:	1 TP on an RJ-45 connector
OUTPUTS:	1 TP on an RJ-45 connector 1 HDMI connector
BANDWIDTH:	Supports up to 1.65Gbps bandwidth per graphic channel
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI and HDCP
CONTROLS:	EDID SETUP button
INDICATOR LEDs:	IN, OUT 1 (LINE), OUT 2 (HDMI), and ON LEDs
POWER SOURCE:	12V DC, 950mA[2]
DIMENSIONS:	18.8cm x 11.4cm x 2.4cm (7.4" x 4.5" x 0.9") W, D, H
WEIGHT:	0.3kg (0.67lbs) approx.
ACCESSORIES:	12V DC 2.1A power supply
OPTIONS:	RK-3T 19" rack mount, Kramer remote external receiver[3], Kramer BC-DGKat524 (CAT 5 24AWG), BC-DGKat623 (CAT 6 23AWG) and BC-DGKat7a23 (CAT 7a 23 AWG) cables, HDMI/HDMI male-to-male cables

1 Specifications are subject to change without notice

2 Full load, for example, when connected with PT-571 and PT-572+

3 C-A35M/IRR or C-A35M/IRE or C-A35M/2IRE

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for three years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC* Rules and Regulations: Part 15: "Radio frequency devices Subpart B Unintentional radiators"

CAUTION!

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.

* FCC and CE approved using STP cable (for twisted pair products)

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com, where updates to this user manual may be found.
We welcome your questions, comments and feedback.

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

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P/N: 2900-000759 REV 2